

REVISIONS																			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED																
A	Delete CAGE 01295 from 8512601BX. Add CAGE 04713 to approved source list. Delete $V_{OH}$ test; add to recommended operating conditions. Change $t_{PLH}$ (10, 11) in table I. Table I, prop. delays, add "A or B to Y". Prop. delay: Change $R_L$ . Revise to military drawing format. Delete $I_{OL}$ test in table I.	87-12-31	M. A. Frye																
B	Add device type 02. Add figure 3: Test circuit and switching waveforms. Update the boilerplate.	92-09-11	M. L. Poelking																

REV																			
SHEET																			
REV																			
SHEET																			

REV STATUS OF SHEETS	REV	B	B	B	B	B	B	B	B	B								
	SHEET	1	2	3	4	5	6	7	8									

PMIC N/A	PREPARED BY Monica L. Grosel	DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444						
<b>STANDARDIZED MILITARY DRAWING</b>  THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE  AMSC N/A	CHECKED BY Robert P. Evans	<b>MICROCIRCUIT, DIGITAL, BIPOLAR, LOW-POWER SCHOTTKY TTL, BUFFERS, MONOLITHIC SILICON</b>						
	APPROVED BY Michael A. Frye							
	DRAWING APPROVAL DATE 3 October 1985							
	REVISION LEVEL  B							
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">SIZE A</td> <td style="width: 25%;">CAGE CODE 67268</td> <td style="width: 60%; text-align: center; font-size: 1.2em;">85126</td> </tr> <tr> <td colspan="2">SHEET</td> <td style="text-align: center;">1 OF 8</td> </tr> </table>	SIZE A	CAGE CODE 67268	85126	SHEET		1 OF 8
SIZE A	CAGE CODE 67268	85126						
SHEET		1 OF 8						

# 1. SCOPE

1.1 Scope. This drawing describes device requirements for class B microcircuits in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices".

1.2 Part or Identifying Number (PIN). The complete PIN shall be as shown in the following example:

<u>85126</u>	<u>01</u>	<u>B</u>	<u>X</u>
Drawing number	Device type (1.2.1)	Case outline (1.2.2)	Lead finish per MIL-M-38510

1.2.1 Device type(s). The device type(s) shall identify the circuit function as follows:

<u>Device type</u>	<u>Generic number</u>	<u>Circuit function</u>
01	54LS33	Quadruple two-input positive NOR buffers with open collector outputs
02	54LS28	Quadruple two-input positive NOR buffers

1.2.2 Case outline(s). The case outline(s) shall be as designated in MIL-STD-1835 and as follows:

<u>Outline letter</u>	<u>Descriptive designator</u>	<u>Terminals</u>	<u>Package style</u>
B	GDFP4-F14	14	flat pack
C	GDIP1-T14	14	dual-in-line
D	GDFP1-F14	14	flat pack
2	CQCC1-N20	20	square chip carrier

1.3 Absolute maximum ratings.

Supply voltage range	- - - - -	-0.5 V dc to +7.0 V dc
Input voltage range	- - - - -	-1.5 V dc at -18 mA to +7.0 V dc
Storage temperature range	- - - - -	-65°C to +150°C
Lead temperature (soldering, 10 seconds)	- - - - -	+300°C
Junction temperature (T <sub>J</sub> )	- - - - -	+175°C
Maximum power dissipation (P <sub>D</sub> ) per device	<u>1</u> /- - - - -	75.9 mW
Thermal resistance, junction-to-case (θ <sub>JC</sub> )	- - - - -	See MIL-STD-1835

1.4 Recommended operating conditions.

Supply voltage range (V <sub>CC</sub> )	- - - - -	4.5 V dc minimum to 5.5 V dc maximum
Maximum high level output voltage (V <sub>OH</sub> ) (type 01)	- - - - -	5.5 V dc
Minimum high level input voltage (V <sub>IH</sub> )	- - - - -	2.0 V dc
Maximum low level input voltage (V <sub>IL</sub> )	- - - - -	0.7 V dc
Maximum high level output current (I <sub>OH</sub> ) (type 02)	- - - - -	-1.2 mA
Maximum low level output current (I <sub>OL</sub> )	- - - - -	12 mA
Case operating temperature range (T <sub>C</sub> )	- - - - -	-55°C to +125°C

1/ Must withstand the added P<sub>D</sub> due to short circuit test; e.g., I<sub>OS</sub>.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE <b>A</b>		85126
		REVISION LEVEL B	SHEET 2

## 2. APPLICABLE DOCUMENTS

2.1 Government specification, standards, and bulletin. Unless otherwise specified, the following specification, standards, and bulletin of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this drawing to the extent specified herein.

### SPECIFICATION

#### MILITARY

MIL-M-38510 - Microcircuits, General Specification for.

### STANDARDS

#### MILITARY

MIL-STD-883 - Test Methods and Procedures for Microelectronics.  
MIL-STD-1835 - Microcircuit Case Outlines.

### BULLETIN

#### MILITARY

MIL-BUL-103 - List of Standardized Military Drawings (SMD's).

(Copies of the specification, standards, and bulletin required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing shall take precedence.

## 3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices" and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein.

3.2.1 Case outline(s). The case outline(s) shall be in accordance with 1.2.2 herein.

3.2.2 Terminal connections. The terminal connections shall be as specified on figure 1.

3.2.3 Truth table. The truth table shall be as specified on figure 2.

3.2.4 Test circuits and switching waveform. The test circuits and switching waveform shall be as specified on figure 3.

3.3 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in table I and shall apply over the full recommended case operating temperature range.

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table II. The electrical tests for each subgroup are described in table I.

3.5 Marking. Marking shall be in accordance with MIL-STD-883 (see 3.1 herein). The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked as listed in MIL-BUL-103 (see 6.6 herein).

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		85126
		REVISION LEVEL B	SHEET 3

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C ≤ T <sub>C</sub> ≤ +125°C 4.5 V ≤ V <sub>CC</sub> ≤ 5.5 V unless otherwise specified		Group A subgroup	Device type	Limits		Unit
						Min	Max	
High level output voltage	V <sub>OH</sub>	V <sub>CC</sub> = 4.5 V, V <sub>IL</sub> = 0.7 V, I <sub>OH</sub> = -1.2 mA		1, 2, 3	02	2.5		V
Low level output voltage	V <sub>OL</sub>	V <sub>CC</sub> = 4.5 V, V <sub>IH</sub> = 2.0 V, I <sub>OL</sub> = 12 mA, V <sub>IL</sub> = 0.7 V		1, 2, 3	All		0.4	V
Input clamp voltage	V <sub>IC</sub>	V <sub>CC</sub> = 4.5 V, I <sub>IN</sub> = -18 mA, T <sub>C</sub> = +25°C		1	All		-1.5	V
High level output current	I <sub>OH</sub>	V <sub>CC</sub> = 4.5 V, V <sub>IH</sub> = 2.0 V, V <sub>OUT</sub> = 5.5 V, V <sub>IL</sub> = 0.7 V		1, 2, 3	01		250	μA
High level input current	I <sub>IH1</sub>	V <sub>CC</sub> = 5.5 V, V <sub>IH</sub> = 7.0 V		1, 2, 3	All		100	μA
	I <sub>IH2</sub>	V <sub>CC</sub> = 5.5 V, V <sub>IH</sub> = 2.7 V		1, 2, 3			20	
Low level input current	I <sub>IL</sub>	V <sub>CC</sub> = 5.5 V, V <sub>IL</sub> = 0.4 V		1, 2, 3	All		-0.4	mA
Short-circuit output current <u>1</u> /	I <sub>OS</sub>	V <sub>CC</sub> = 5.5 V		1, 2, 3	02	-30	-130	mA
Supply current	I <sub>CCH</sub>	V <sub>CC</sub> = 5.5 V, V <sub>IN</sub> = 0.0 V	Outputs high	1, 2, 3	All		3.6	mA
	I <sub>CCL</sub>	V <sub>CC</sub> = 5.5 V, V <sub>IN</sub> = 4.5 V	Outputs low	1, 2, 3			13.8	
Functional testing		See 4.3.1c		7	All			
Propagation delay time,  A or B to Q	t <sub>PLH</sub>	V <sub>CC</sub> = 5.0 V, R <sub>L</sub> = 667Ω ±5%,  C <sub>L</sub> = 50 pF ±10%  <u>2</u> /		9	01		32	ns
					02		24	
				10, 11	01		45	
					02		34	
	t <sub>PHL</sub>			9	01		28	
					02		24	
				10, 11	01		39	
					02		34	

1/ Not more than one output should be shorted at a time and the duration of the short circuit should not exceed 1 second.

2/ Propagation delay time testing may be done using either R<sub>L</sub> = 667Ω or R<sub>L</sub> = 2 kΩ.

STANDARDIZED  
MILITARY DRAWING  
DEFENSE ELECTRONICS SUPPLY CENTER  
DAYTON, OHIO 45444

SIZE  
**A**

**85126**

REVISION LEVEL  
B

SHEET  
**4**

Device types	01 and 02	
Case outlines	B, C, and D	2
Terminal number	Terminal symbol	
1	1Y	NC
2	1A	1Y
3	1B	1A
4	2Y	1B
5	2A	NC
6	2B	2Y
7	GND	NC
8	3A	2A
9	3B	2B
10	3Y	GND
11	4A	NC
12	4B	3A
13	4Y	3B
14	V <sub>CC</sub>	3Y
15	---	NC
16	---	4A
17	---	NC
18	---	4B
19	---	4Y
20	---	V <sub>CC</sub>

NC = No connection

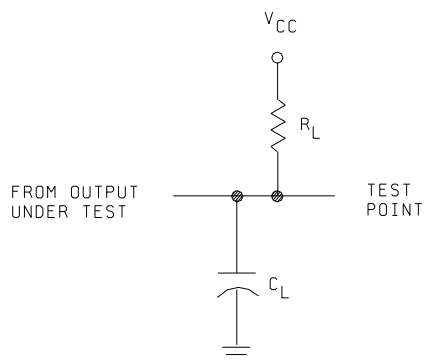
FIGURE 1. Terminal connections.

Inputs		Output
A	B	Y
L	L	H
L	H	L
H	L	L
H	H	L

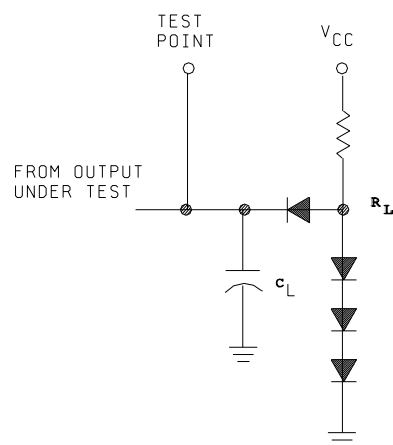
H = High level voltage  
L = Low level voltage

FIGURE 2. Truth table.

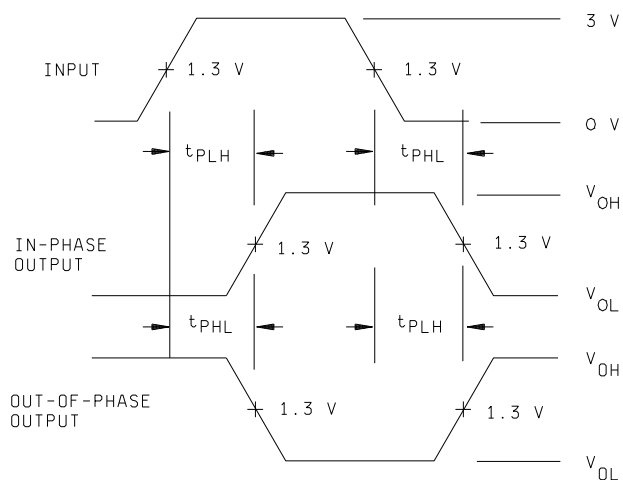
<b>STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444</b>	<b>SIZE A</b>		<b>85126</b>
		<b>REVISION LEVEL B</b>	<b>SHEET 5</b>



Test circuit for device type 01



Test circuit for device type 02



NOTES:

1.

$C_L$  includes probe and jig capacitance.

2. All diodes are 1N3064 or equivalent.

3. All input pulses have the following characteristics:  $PRR \leq 1 \text{ MHz}$ ,  $Z_{OUT} \approx 50 \Omega$ ,  $t_r \leq 15 \text{ ns}$ ,  $t_f \leq 6 \text{ ns}$ .

4. The outputs are measured one at a time with one input transition per measurement.

FIGURE 3. Test circuits and switching waveform.

STANDARDIZED  
MILITARY DRAWING  
DEFENSE ELECTRONICS SUPPLY CENTER  
DAYTON, OHIO 45444

SIZE  
**A**

85126

REVISION LEVEL  
B

SHEET  
6

3.6 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in MIL-BUL-103 (see 6.6 herein). The certificate of compliance submitted to DESC-EC prior to listing as an approved source of supply shall affirm that the manufacturer's product meets the requirements of MIL-STD-883 (see 3.1 herein) and the requirements herein.

3.7 Certificate of conformance. A certificate of conformance as required in MIL-STD-883 (see 3.1 herein) shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change. Notification of change to DESC-EC shall be required in accordance with MIL-STD-883 (see 3.1 herein).

3.9 Verification and review. DESC, DESC's agent, and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with section 4 of MIL-M-38510 to the extent specified in MIL-STD-883 (see 3.1 herein).

4.2 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. The following additional criteria shall apply:

a. Burn-in test, method 1015 of MIL-STD-883.

(1) Test condition A, B, C or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. The test circuit shall include the requirements for inputs, outputs, biases, and power dissipation, as applicable, in accordance with the specified purpose of method 1015.

(2)  $T_A = +125^{\circ}\text{C}$ , minimum.

b. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burn-in are optional at the discretion of the manufacturer.

4.3 Quality conformance inspection. Quality conformance inspection shall be in accordance with method 5005 of MIL-STD-883 including groups A, B, C, and D inspections. The following additional criteria shall apply.

##### 4.3.1 Group A inspection.

a. Tests shall be as specified in table II herein.

b. Subgroups 4, 5, 6, and 8 in table I, method 5005 of MIL-STD-883 shall be omitted.

c. Subgroup 7 shall include verification of the truth table specified on figure 2 herein.

##### 4.3.2 Groups C and D inspections.

a. End-point electrical parameters shall be as specified in table II herein.

b. Steady-state life test conditions, method 1005 of MIL-STD-883.

(1) Test condition A, B, C, or D using the circuit submitted with the certificate of compliance (see 3.6 herein).

(2)  $T_A = +125^{\circ}\text{C}$ , minimum.

(3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		85126
		REVISION LEVEL B	SHEET 7

TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (per method 5005, table I)
Interim electrical parameters (method 5004)	---
Final electrical test parameters (method 5004)	1*, 2, 3, 9
Group A test requirements (method 5005)	1, 2, 3, 7, 9, 10**, 11**
Groups C and D end-point electrical parameters (method 5005)	1, 2, 3

\* PDA applies to subgroup 1.

\*\* Subgroups 10 and 11, if not tested, shall be  
guaranteed to the specified limits in table I.

## 5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510.

## 6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for OEM application. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-38510, the device specified herein will be inactivated and will not be used for new design. The QPL-38510 product shall be the preferred item for all applications.

6.2 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.3 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished in accordance with MIL-STD-481 using DD Form 1693, Engineering Change Proposal (Short Form).

6.4 Record of users. Military and industrial users shall inform Defense Electronics Supply Center when a system application requires configuration control and the applicable SMD. DESC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronics devices (FSC 5962) should contact DESC-EC, telephone (513) 296-6047.

6.5 Comments. Comments on this drawing should be directed to DESC-EC, Dayton, Ohio 45444, or telephone (513) 296-5377.

6.6 Approved sources of supply. Approved sources of supply are listed in MIL-BUL-103. The vendors listed in MIL-BUL-103 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DESC-EC.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE <b>A</b>		<b>85126</b>
		REVISION LEVEL B	SHEET <b>8</b>



## STANDARDIZED MILITARY DRAWING SOURCE APPROVAL BULLETIN

DATE: 92-09-11

Approved sources of supply for SMD 85126 are listed below for immediate acquisition only and shall be added to MIL-BUL-103 during the next revision. MIL-BUL-103 will be revised to include the addition or deletion of sources. The vendors listed below have agreed to this drawing and a certificate of compliance has been submitted to and accepted by DESC-EC. This bulletin is superseded by the next dated revision of MIL-BUL-103.

Standardized military drawing PIN	Vendor CAGE number	Vender similar PIN <u>1</u> /
8512601BX	<u>2</u> /	
8512601CX	01295	SNJ54LS33J
8512601DX	01295	SNJ54LS33W
85126012X	01295	SNJ54LS33FK
8512602CX	01295	SNJ54LS28J
8512602DX	01295	SNJ54LS28W
85126022X	01295	SNJ54LS28FK

1/ Caution. Do not use this number for item acquisition.  
Items acquired to this number may not the performance  
requirements of this drawing.

2/ Approved source of supply is not available.

Vendor CAGE  
number

01295

Vendor name  
and address

Texas Instruments, Incorporated  
13500 North Central Expressway  
P.O. Box 655303  
Dallas, TX 75265  
Point of contact: I-20 at FM 1788  
Midland, TX 79711-0448

The information contained herein is disseminated for convenience only  
and the Government assumes no liability whatsoever for any  
inaccuracies in this information bulletin.